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O'BANION & RITCHEY LLP/ SONY ELECTRONICS, INC.
400 CAPITOL MALL
SUITE 1550
SACRAMENTO, CA 95814

EXAMINER	
WENDELL, ANDREW	
ART UNIT	**PAPER NUMBER**
2643	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/814,419	NISHIDA ET AL.
	Examiner	Art Unit
	Andrew Wendell	2643

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *30 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-49* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14, 18-29, and 33-49* is/are rejected.

7)☒ Claim(s) *15-17 and 30-32* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-12, 18-25, 33-34, 42, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Evans et al. (US Pat Appl# 2005/0277426) in view of Gray et al. (US Pat# 6,674,403).

Regarding claim 1, Evans et al. system for locating a mobile unit teaches a first network device 3 (Fig. 1) configured for wirelessly communicating beacon frames (Sections 0037 and 0039) which include signal strength information with at least a second network device 4 (Fig. 1). Evans et al. teaches about detecting proximity motion in response to signal strength (Section 0006 and 0010). However, Evans et al. fails to clearly teach about signal strength regression analysis.

Gray et al. position detection and location tracking in a wireless network teaches means for detecting proximity motion in response to signal strength regression analysis when the first network device is moved within the proximity of the second network device (Col. 4 lines 4-16, Col. 7 lines 44-55, Col. 9 lines 1-26, and Col. 10 lines 14-34).

Therefore, it would have been obvious at the time of the invention to one of ordinary skill in the art at the time the invention was made to incorporate signal strength

regression analysis as taught by Gray et al. into Evans et al. system in order to accuracy and reliability of tracking (Col. 4 lines 63-64).

Regarding claim 2, Evans et al. teaches a motion monitoring module configured for continuously monitoring signal parameters within beacon frames (Section 0037 and 0039) and a motion detection module configured for comparing the output of the analysis against one or more thresholds to determine whether proximal motion has occurred (Section 0040-0042). Evans et al. fails to teach regression analysis.

Gray et al. teaches a regression analysis module configured for performing a regression analysis of signal strengths (Col. 4 lines 4-16, Col. 7 lines 44-55, Col. 9 lines 1-26, and Col. 10 lines 14-34).

Therefore, it would have been obvious at the time of the invention to one of ordinary skill in the art at the time the invention was made to incorporate signal strength regression analysis as taught by Gray et al. into Evans et al. system in order to accuracy and reliability of tracking (Col. 4 lines 63-64).

Regarding claim 3, Evans et al. teaches a first network device configured for communicating wirelessly with at least a second network device (Section 0024); means for communicating beacon frames containing signal strength information between the first network device and the second network device (Section 0037 and 0039). Evans et al. teaches about detecting proximity motion in response to signal strength (Section 0006 and 0010). However, Evans et al. fails to clearly teach about signal strength regression analysis.

Gray et al. teaches means for performing a signal strength regression analysis on received signal strength information (Col. 4 lines 4-16, Col. 7 lines 44-55, Col. 9 lines 1-26, and Col. 10 lines 14-34); and means for generating a proximity motion detection signal in response the signal strength regression analysis performed during close proximity relative motion between the first network device and the second network device (Col. 3 lines 42-45).

Therefore, it would have been obvious at the time of the invention to one of ordinary skill in the art at the time the invention was made to incorporate signal strength regression analysis as taught by Gray et al. into Evans et al. system in order to accuracy and reliability of tracking (Col. 4 lines 63-64).

Regarding claim 4, the combination including Evans et al. teaches a media access control module for dispatching beacon frames to wireless devices in the wireless network (Section 0037).

Regarding claim 5, the combination including Evans et al. teaches the beacon frame is an IEEE 802.11network formatted data frame (Section 0037).

Regarding claim 6, the combination including Evans et al. teaches transmitting beacon frames from the first network device acting as a sending wireless device for receipt by the second network device acting as a receiving wireless device, or from the second network device acting as a sending wireless device for receipt by the first network device acting as a receiving wireless device (Section 0042).

Regarding claim 7, the combination including Evans et al. teaches a motion monitoring module operating in combination with a beacon detection module (Section

0037 and 0039); wherein the motion monitoring module continuously monitors signal strength parameters in beacon frames (Section 0040).

Regarding claim 8, the combination including Evans et al. teaches wherein the motion monitoring module continuously monitors frame beacons (Section 0037) transmitted by the sending wireless device to the receiving wireless device at a predetermined transmission interval (Section 0039).

Regarding claim 9, the combination including Evans et al. teaches the possibility wherein the predetermined transmission interval is at or less than approximately 100 milliseconds (mS.) (Section 0039).

Regarding claim 10, the combination including Evans et al. teaches wherein the beacon frame detection module tunes the interval frequency for transmitting the beacon frames between a receiving wireless device and a sending wireless device (Section 0042).

Regarding claim 11, the combination including Gray et al. teaches wherein the means for performing a signal strength regression analysis comprises a signal strength regression analysis module (Col. 4 lines 4-16, Col. 7 lines 44-55, Col. 9 lines 1-26, and Col. 10 lines 14-34) configured for regressively analyzing the difference in signal strength between the sending wireless device and the receiving wireless device as the sending wireless device proximately motions towards the receiving wireless device (Col. 3 lines 5-20 and 42-45).

Regarding claim 12, the combination including Gray et al. teaches wherein the signal strength regression analysis module is configured for analyzing the difference in

signal strength for a recorded set of signal information retained by the receiving wireless device in order to determine whether the sending wireless device is in proximity motion to the receiving wireless device (Col. 4 lines 4-16, Col. 7 lines 44-55, Col. 9 lines 1-26, and Col. 10 lines 14-34).

Regarding claim 18, Evans et al. teaches maneuvering a second mobile wireless device in relation to a first, fixed location, wireless device within a given proximity range (Sections 0039-0042); continuously monitoring the strength of signals transmitted between the first target wireless device and the second mobile wireless device as the second wireless device moves towards the first wireless device (Sections 0039-0042). Evans et al. teaches about detecting proximity motion in response to signal strength (Section 0006 and 0010). However, Evans et al. fails to clearly teach about signal strength regression analysis.

Gray et al. teaches regressively analyzing the monitored signal strength to determine the proximity motion of the second mobile wireless device with respect to the first target wireless device to determine whether a given proximity range is achieved (Col. 4 lines 4-16, Col. 7 lines 44-55, Col. 9 lines 1-26, and Col. 10 lines 14-34).

Therefore, it would have been obvious at the time of the invention to one of ordinary skill in the art at the time the invention was made to incorporate signal strength regression analysis as taught by Gray et al. into Evans et al. system in order to accuracy and reliability of tracking (Col. 4 lines 63-64).

Regarding claim 19, the combination including Evans et al. teaches the possibility of wherein the given proximity range is less than about 15 centimeters (Sections 0049).

Regarding claim 20, the combination including Evans et al. teaches wherein the given proximity range is about 5 centimeters (Section 0049).

Regarding claim 21, the combination including Evans et al. teaches further comprising estimating the relationship between the second mobile wireless device and the first target wireless device without being dependent on the type of the second mobile wireless device to maintain compatibility in a heterogeneous network environment (Sections 0001 and 0002).

Regarding claim 22, the combination including Evans et al. teaches wherein either the first target wireless device or the second mobile wireless device is configured for sending or receiving beacon frames as the first target wireless device and the second mobile wireless device communicatively couple (Sections 0037, 0039, and 0042).

Regarding claim 23, the combination including Evans et al. teaches wherein as the second wireless device is maneuvered towards the first target wireless device, the distance between the first target wireless device and the second mobile wireless device is substantially reduced while the strength of the signal between the second mobile wireless device and the first wireless device increase (Fig. 5 and section 0033).

Regarding claim 24, the combination including Evans et al. teaches wherein the regressively analyzing the strength of the signal comprises continuously monitoring the

strength of the signal of the beacon frames received at a receiving device of either the first target wireless device or the second mobile wireless device to determine if one of the two wireless devices is in proximity motion with the other (Section 0039).

Regarding claim 25, the combination including Evans et al. teaches calculating the difference between the strength of the signal at a designated time with respect to a time prior to the designated time to determine the strength of the signal as the second mobile wireless device approaches the first target wireless device (Sections 0006 and 0039).

Regarding claim 33, Evans et al. teaches continuously monitoring beacon frames transmitted by the second sending wireless node to the first receiving wireless node (Sections 0039 and 0040); recording the signal strength information contained in the beacon frame transmitted by the second sending wireless node (Section 0040); retaining the recorded signal strength information in the first receiving wireless node for a designated period of time (Sections 0040 and 0041). Evans et al. teaches about detecting proximity motion in response to signal strength (Section 0006 and 0010). However, Evans et al. fails to clearly teach about signal strength regression analysis.

Gray et al. teaches regressively analyzing the retained signal strength information to determine the proximity motion of the second sending wireless node with respect to the first receiving wireless node (Col. 4 lines 4-16, Col. 7 lines 44-55, Col. 9 lines 1-26, and Col. 10 lines 14-34).

Therefore, it would have been obvious at the time of the invention to one of ordinary skill in the art at the time the invention was made to incorporate signal strength

regression analysis as taught by Gray et al. into Evans et al. system in order to accuracy and reliability of tracking (Col. 4 lines 63-64).

Regarding claim 34, the combination including Gray et al. teaches wherein the regressively analyzing of the retained signal strength information comprises calculating the difference in the signal strength with respect to a sampling signal period (Col. 4 lines 4-16 and Col. 10 lines 14-34).

Regarding claim 42, Evans et al. teaches calculating signal strength fluctuations between the mobile wireless device and the stationary wireless device during proximity motion (Sections 0039 and 0040); analyzing the signal strength difference between the mobile wireless device and the stationary wireless device as the mobile wireless device approaches the stationary wireless device (Sections 0039-0042). Evans et al. teaches about detecting proximity motion in response to signal strength (Section 0006 and 0010). However, Evans et al. fails to clearly teach about signal strength regression analysis.

Gray et al. teaches regressively analyzing the difference in the signal strength with respect to the recorded signal strength information during a signal sampling period to determine whether the mobile wireless device is in proximity motion with respect to stationary wireless device (Col. 4 lines 4-16, Col. 7 lines 44-55, Col. 9 lines 1-26, and Col. 10 lines 14-34).

Therefore, it would have been obvious at the time of the invention to one of ordinary skill in the art at the time the invention was made to incorporate signal

strength regression analysis as taught by Gray et al. into Evans et al. system in order to accuracy and reliability of tracking (Col. 4 lines 63-64).

Regarding claim 44, the combination including Evans et al. teaches further comprising calculating the difference in signal strength between the mobile wireless device and the fixed wireless difference with respect to a recorded set of sample signal strength information (Sections 0039-0042).

3. Claims 13-14, 26-29, 35-40, and 45-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Evans et al. (US Pat Appl# 2005/0277426) in view of Gray et al. (US Pat# 6,674,403) and in further view of Nardone et al. (IEEE Journal, "A Closed-Form Solution to Bearings-Only Target Motion Analysis," copyright 1997).

Regarding claim 13, the combination of Evans et al. in view of Gray et al. teaches the limitations in claim 12. Both Evans et al. and Gray et al. fail to teach about a regression coefficient.

Nardone et al. teaches wherein the analysis module is configured for calculating a regression coefficient of the difference in data points of the recorded set of data points (Page 169, last paragraph in the left column).

Therefore, it would have been obvious at the time of the invention to one of ordinary skill in the art at the time the invention was made to incorporate a regression coefficient as taught by Nardone et al. into signal strength regression analysis as taught by Gray et al. into Evans et al. system in order to improve noise cancellation and process information of interest (Page 175, Conclusion).

Regarding claim 14, the combination including Nardone et al. teaches wherein the regression analysis module is configured to calculate a coefficient of determination in the data points for the recorded set of data points (Page 169, last paragraph in the left column).

Regarding claim 26, the combination including Nardone et al. teaches wherein the regressively analyzing the signals further comprise linearly analyzing the difference in data points for a recorded set of data points information with respect to the number sample signals over a period of time (Page 169, last paragraph in the left column).

Regarding claim 27, the combination including Nardone et al. teaches further comprising calculating a regression coefficient of the difference in the data points of the recorded set of data points (Page 169, last paragraph in the left column).

Regarding claim 28, the combination including Nardone et al. teaches further comprising calculating a coefficient of determination of the difference in the data points for the recorded set of data information (Page 169, last paragraph in the left column).

Regarding claim 29, the combination including Evans et al. teaches further comprising calculating an increase in the signal strength from the start to the end of a proximity motion by the second mobile wireless device (Sections 0039-0040).

Regarding claim 35, the combination including Nardone et al. teaches further comprising linearly analyzing the differences in the data points with respect to the number of sampled signals to generate a regressive coefficient of the signals sampled (Page 169, last paragraph in the left column).

Regarding claim 36, the combination including Nardone et al. teaches further comprising linearly analyzing the differences in the data points with respect to the number of sampled signals to generate a regression coefficient of determination of the signals sampled (Page 169, last paragraph in the left column).

Regarding claim 37, the combination including Evans et al. teaches further comprising calculating the increase in signal strength from the start to the end of a proximity motion of a mobile wireless device with respect to a fixed wireless device (Sections 0039-0041).

Regarding claim 38, the combination including Nardone et al. teaches the possibility of wherein motion is detected in response to a regression coefficient of approximately 0.70 (Page 169, last paragraph in the left column).

Regarding claim 39, the combination including Nardone et al. teaches the possibility of wherein proximity motion is detected in response to a regression coefficient of approximately 0.75 (Page 169, last paragraph in the left column).

Regarding claim 40, the combination including Evans et al. teaches wherein proximity motion of a mobile wireless device with respect to a fixed wireless device is detected in response to a predetermined threshold value (Sections 0039-0041). Both Evans et al. and Gray et al. fails to teach about a regression coefficient.

Nardone et al. teaches a regression coefficient (Page 169, last paragraph in the left column).

Therefore, it would have been obvious at the time of the invention to one of ordinary skill in the art at the time the invention was made to incorporate a regression

coefficient as taught by Nardone et al. into signal strength regression analysis as taught by Gray et al. into Evans et al. system in order to improve noise cancellation and process information of interest (Page 175, Conclusion).

Regarding claim 45, the combination including Gary et al. teaches further comprising performing a linear regression analysis on the difference in signal strength on the signals transmitted between the mobile wireless device and the fixed wireless device with respect to the number of signals in a given sample (Col. 4 lines 4-16, Col. 7 lines 44-55, Col. 9 lines 1-26, and Col. 10 lines 14-34). Both Gary et al. and Evans et al. fail to teach about a regression coefficient.

Nardone et al. teaches a regression coefficient of a signal (Page 169, last paragraph in the left column).

Therefore, it would have been obvious at the time of the invention to one of ordinary skill in the art at the time the invention was made to incorporate a regression coefficient as taught by Nardone et al. into signal strength regression analysis as taught by Gray et al. into Evans et al. system in order to improve noise cancellation and process information of interest (Page 175, Conclusion).

Regarding claim 46, method claim 46 is rejected for the same reason as method claim 45 since the recited element would perform the claimed steps.

Regarding claim 47, the combination including Evans et al. teaches wherein proximity motion of a mobile wireless device with relative to a fixed wireless device is detected in response to a threshold value (Sections 0039-0041). Both Evans et al. and Gray et al. fails to teach about a coefficient of determination.

Nardone et al. teaches a regression coefficient (Page 169, last paragraph in the left column).

Therefore, it would have been obvious at the time of the invention to one of ordinary skill in the art at the time the invention was made to incorporate a coefficient of determination as taught by Nardone et al. into signal strength regression analysis as taught by Gray et al. into Evans et al. system in order to improve noise cancellation and process information of interest (Page 175, Conclusion).

Regarding claim 48, the combination including Nardone et al. teaches the possibility of wherein the threshold of the coefficient of determination is approximately 0.70 (Page 169, last paragraph in the left column).

Regarding claim 49, the combination including Nardone et al. teaches the possibility of wherein the threshold of the coefficient of determination is approximately 0.75. (Page 169, last paragraph in the left column).

4. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Evans et al. (US Pat Appl# 2005/0277426) in view of Gray et al. (US Pat# 6,674,403) in view of Nardone et al. (IEEE Journal, "A Closed-Form Solution to Bearings-Only Target Motion Analysis," copyright 1997) and in further view of Agrawala et al. (US Pat Appl# 2005/0243936).

Regarding claim 41, the combination including Evans et al. in view of Gray et al. in view of Nardone et al. teaches the limitations in claim 40. Evans et al., Gray et al., and Nardone et al. fail to teach about a pre-calibrated signal strength.

Agrawala et al. method for determining user location in a wireless communication network teaches further comprising pre-calibrating the increase in signal strength prior to using increases in the signal strength (Section 0016 and 0030) by the regression analysis scheme to determine proximity motion of the mobile wireless device with respect to the fixed wireless device (Sections 0044-0045 and 0057).

Therefore, it would have been obvious at the time of the invention to one of ordinary skill in the art at the time the invention was made to incorporate a pre-calibrated signal strength as taught by Agrawala et al. into a regression coefficient as taught by Nardone et al. into signal strength regression analysis as taught by Gray et al. into Evans et al. system in order to reduce hardware, improve spatial resolution, and reducing costs (Section 0015).

5. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Evans et al. (US Pat Appl# 2005/0277426) in view of Gray et al. (US Pat# 6,674,403) as applied to claim 42 above, and further in view of Agrawal et al. (US Pat# 6,879,812).

Regarding claim 43, the combination including Evans et al. in view of Gray et al. teaches the limitation in claim 42. Both Evans et al. and Gray et al. fail to teach about an IBSS mode.

Agrawal et al. portable computing device teaches wherein the stationary wireless device and the mobile wireless device are configured in IBSS mode with one of the fixed wireless device and the mobile wireless device being configured as an access point node (Col. 8 line 58-Col. 9 line 4).

Therefore, it would have been obvious at the time of the invention to one of ordinary skill in the art at the time the invention was made to incorporate a IBSS mode as taught by Agrawal et al. into signal strength regression analysis as taught by Gray et al. into Evans et al. system in order to correct network problems faster (Col. 1 lines 28-67).

Allowable Subject Matter

6. Claims 15-17 and 30-32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chen et al. discloses a geolocation using enhanced timing advance techniques. Dietrich et al. discloses a location of wireless nodes using signal strength weighting metric.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Wendell whose telephone number is 571-272-0557. The examiner can normally be reached on 7:30-5 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz can be reached on 571-272-7499. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Andrew Wendell

Andrew Wendell

Date: 1/6/2005

Dnguyen

DUC NGUYEN
PRIMARY EXAMINER

ASW